CURRENT CONDITIONS REPORT
Delphi Special Products Corporation
Former Anaheim Battery Operations
1201 North Magnolia Avenue
Anaheim, California

VOLUME I of II
Report/Tables/Figures

by:

Haley & Aldrich, Inc.
Brea, California

for:

Delphi Corporation
Troy, Michigan

File No. 32486-002
January 2006

HALEY & ALDRICH

Haley & Aldrich, Inc.
500 South Kraemer Blvd.
Suite 370
Brea, CA 92821-6723

Tel: 714.985.3434
Fax: 714.985.3433
HaleyAldrich.com

HALEY& ALDRICH

3 February 2006
File No. 32486-002

Department of Toxic Substances Control
Tiered Permitting and Corrective Action Branch
5796 Corporate Avenue
Cypress, California 90630

Attention: Mr. John Geroch

Subject: Current Conditions Report
Delphi Corporation
Former Anaheim Battery Operations
1201 North Magnolia Avenue
Anaheim, California

Dear Mr. Geroch:

On behalf of Delphi Corporation (Delphi), Haley & Aldrich, Inc. (Haley & Aldrich) is pleased to submit three hardcopies of the Current Conditions Report (CCR) for the former Delphi Facility located at 1201 N. Magnolia Avenue, Anaheim, California. The CCR has been prepared at the request of the California Department of Toxic Substances Control.

Sincerely yours,
HALEY & ALDRICH, INC.

Original signed by
Thomas Tatnall

PROFESSIONAL GEOLOGIST
THOMAS S. TATNALL
CERTIFIED ENGINEERING GEOLOGIST
No. 1968
Exp. 3/31/07
STATE OF CALIFORNIA

Thomas S. Tatnall, CEG No. 1968, REA
Project Manager

Original signed by Dave Hagen

Dave Hagen
Officer in Charge

Original signed by Jeff Reardon

Jeff Reardon, PG No. 3679, CEG No. 1124
Senior Engineer

Original signed by Anita Broughton

Anita Broughton, REA, EIT, CIH
Principal Risk Assessor

Enclosures

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EXECUTIVE SUMMARY

This Current Conditions Report (CCR) has been prepared by Haley & Aldrich, Inc. (Haley & Aldrich), on behalf of Delphi Corporation (Delphi), for Delphi's former Anaheim Battery Operations facility (Site) located at 1201 North Magnolia Avenue, Anaheim, California. The California Environmental Protection Agency Department of Toxic Substances Control (DTSC) Tiered Permitting Corrective Action Branch has requested that Delphi complete a site assessment of this Site. As part of the site assessment process, DTSC has requested that a CCR be prepared. The CCR will provide the basis for the content of a Facility Investigation (FI) Work Plan, which will be prepared under separate cover.

The purpose of the CCR is to describe the current condition of 53 Areas of Interest (AOIs) at the Site, which include previously identified Solid Waste Management Units (SWMUs), recognized environmental conditions (RECs), and other areas of potential environmental concern identified during the data review portion of this effort. The information presented in this CCR includes both historical data and data collected during the 2005 Haley & Aldrich sampling and analysis activities.

The 2005 Sampling and Analysis Plan described herein is based on information presented in previous environmental reports prepared for the Site, and on historical information regarding the types of chemicals known to have been used or likely used in the various on-site operations. Prior to its implementation, the sampling program was discussed with DTSC. The sampling program involved the collecting of soil, soil gas, groundwater, and concrete samples were collected. Soil samples were tested for a variety of constituents including metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), including polynuclear aromatic hydrocarbons (PAHs), petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and metals. Soil gas was analyzed for VOCs. Groundwater was analyzed for metals and VOCs, and concrete chip and core samples were analyzed primarily for lead and PCBs. This CCR focuses on subsurface investigation activities and discusses soil, soil gas, and groundwater impacts. Analytical results of the concrete chip and core samples indicating the concrete that will be disposed of off-site are also presented. The primary detected chemicals include metals (primarily lead), VOCs, PAHs, and PCBs in soil, and various VOCs in soil gas and groundwater.

The decision to perform initial sampling at a specific AOI was based on its operational history and configuration, previous investigation results, chemical processes, and damaged and discolored concrete pavement. The determination of whether an impacted area is considered delineated was based on chemical concentrations less than the delineation criteria, decreasing chemical concentration trends in successive step-outs, or where direct observations of an apparent release (e.g., discolored or damaged concrete, or discolored soil) clearly defines the lateral limits of contamination. A delineation criterion was derived protective of human health and the environment to residential use for each media and detected Site-related chemical by developing various chemical thresholds that are considered protective of groundwater quality and protective of human health. The lower of the chemical thresholds was determined to be the delineation criterion for that chemical in the given media. Results of the CCR indicated that 28 of the 53 AOIs were deemed fully delineated and no further investigation will be required. The remaining AOIs were determined to require additional delineation either during the FI phase or as part of the Remedial Investigation phase as described below. It is recommended that the following additional soil, soil gas, and

groundwater samples be collected at specific AOIs and analyzed to complete delineation activities at the Site:

- Additional soil sampling is recommended during FI activities at AOIs 1, 10, 25, 26, 27 28, 29, 30, 31, 33, 34, 37, 38, 39, 41, 43, 45, 48, 50, and 53.

- Additional soil sampling is recommended during remedial activities at AOIs 11, 18, 28, and 36.

- Additional soil gas sampling is recommended during FI activities at AOIs 1, 22, 25, 26, 27, 30, 31, 32, 34, 37, 39, 41, and 43. AOIs 25, 26, 30, 31 and 37 in proximity to the northern portion of Warehouse No. 3 will be investigated as one unit.

- Additional sampling of groundwater (AOI 53) is recommended during FI activities along the western property line in proximity to AOIs 25, 26, 30, 31, and 37 near the northern portion of Warehouse No. 3. .

Proposed additional site assessment activities will be described in an FI Work Plan, which will be submitted under separate cover.

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AETL	American Environmental Testing Laboratory
AOI	Area of Interest
ARAR	Applicable or Relevant and Appropriate Requirement
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylene
Cal-EPA	California Environmental Protection Agency
CCR	Current Conditions Report
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Register
CFS	cubic feet per second
CHHSL	California Human Health Screening Level
COC	Chain-Of-Custody
COPC	Chemical of Potential Concern
CRA	Conestoga-Rovers & Associates
DAF	Dilution-Attenuation Factor
DCA	dichloroethane
DCE	dichloroethene
DHS	California Department of Health Services
DO	dissolved oxygen
DTSC	California Environmental Protection Agency Department of Toxic Substances and Control
EDR	Environmental Data Resources, Inc.
EE/CA	Engineering Evaluation and Cost Analysis
EOA	Environmental Oversight Agreement
ESA	Environmental Site Assessment
FI	Facility Investigation
gpm	gallons per minute
H&SC	California Health & Safety Code
HASP	Health and Safety Plan
HEAST	Health Effects Assessment Summary Tables
HERD	Human and Ecological Risk Division
I-5	Interstate 5
IDL	Instrument Detection Limit
IDW	investigation-derived waste

IRIS	Integrated Risk Information System
LCS	Laboratory Control Sample
LFR	?
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ml	milliliter
ml/min	milliliters per minute
MS	Matrix Spike
MSD	Matrix Spike Duplicate
msl	Mean Sea Level
MWD	Metropolitan Water District
NCEA	National Center for Environmental Assessment
NCP	National Contingency Plan
NFRAP	No Further Response Action Planned
NOE	Notice of Exemption
NTU	Nephelometric Turbidity Unit
OCP	organochlorine pesticide
OEHHA	Office of Environmental Health Hazard Assessment
ORP	oxidation-reduction potential
PAH	polynuclear aromatic hydrocarbons
PAOL	Potential Area of Liability
PBR	Permit-by-Rule
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/L	picocuries per liter
PEA	Preliminary Environmental Assessment
PID	Photo-ionization Detector
POTW	Publicly Owned Treatment Works
PPE	personal protective equipment
ppm	parts per million
PRG	Preliminary Remediation Goal
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance and quality control
QC	quality control

RAO	Removal Action Objective
RAW	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RfD	Oral Reference Dose
ROP	Regional Occupational Program
RWQCB	Regional Water Quality Control Board
SBCUSD	San Bernardino City Unified School District
SSHSP	Site Specific Health and Safety Plan
SSI	Supplemental Site Investigation
SSL	Soil Screening Level
SSO	Site Safety Officer
STLC	Soluble Threshold Limit Concentration
SV	site visit
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCA	trichloroethane
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
TTLC	Total Threshold Limit Concentration
TTU	Transportable Treatment Unit
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
VSI	visual site inspection
WET	Waste Extraction Test
WWTU	Wastewater Treatment Unit
XRF	X-Ray Fluorescence
yds^3	cubic yards

1. INTRODUCTION

This Current Conditions Report (CCR) has been prepared by Haley & Aldrich, Inc. (Haley & Aldrich), on behalf of Delphi Corporation (Delphi), for the former Delphi Anaheim Battery Operations facility (Site) located at 1201 North Magnolia Avenue, Anaheim, California. The location of the Site is shown on Figure 1. Delphi is working voluntarily with the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) Tiered Permitting Corrective Action Branch to conduct the site assessment requested by DTSC. As part of the site assessment process, Delphi has prepared this CCR.

1.1 Purpose

The purpose of the CCR is to describe the current condition of 53 Areas of Interest (AOIs) (Figure 2) at the Site, which includes previously identified Solid Waste Management Units (SWMUs), recognized environmental conditions (RECs), and other areas of potential environmental concern identified during the data review portion of this effort. The information presented in the CCR includes both historical data and data collected during the 2005 Haley & Aldrich sampling and analysis activities (Haley & Aldrich, 2005). This CCR focuses on subsurface investigation activities and soil, soil gas, and groundwater impacts. The analytical results of the concrete chip and core samples that will determine the concrete that will need to be disposed of off-site are also presented.

This CCR will provide the basis for a Facility Investigation (FI) Work Plan, which will be submitted under separate cover.

1.2 Organization of Report

This CCR is organized as follows:

- Section 2: Facility Description
- Section 3: Facility History
- Section 4: Environmental Setting
- Section 5: Sampling Activities and Procedures (Haley & Aldrich, 2005)
- Section 6: Comprehensive Findings and Analytical Results
- Section 7: Data Validation
- Section 8: HASP Implementation
- Section 9: Recommendations
- Section 10:References

Supporting tables and figures are presented in this CCR; additional relevant information is presented in the following appendices:

- Appendix A - Regulatory Agency Correspondence

- Appendix B - Site Photographs
- Appendix C - Historical Documents
- Appendix D - Health and Safety Plan
- Appendix E - Quality Assurance Protection Plan
- Appendix F – Johnson & Ettinger Model Results for Soil Gas CHHSLs and Background Statistics Documentation
- Appendix G - Boring Logs
- Appendix H – Analytical Data Reports
- Appendix I – Data Validation Documentation

2. FACILITY DESCRIPTION

The Site consists of approximately 26 acres at 1201 North Magnolia Avenue in a commercial/industrial section of the City of Anaheim, Orange County, California (Figure 1). Though the Main Production Building has been demolished, the original building was constructed in 1953 by Delco Remy, a Division of General Motors, for the production of automotive batteries. A review of previous environmental reports indicates that the major on-site construction activities that have occurred since then were in 1963, 1974, and 1977 for a warehouse and production line buildings. The production area floor space was approximately 285,568 square feet. Prior to the 2005 decommissioning and plant demolition, the Site consisted of the Main Production Building, the South Building (New Charge Building), three warehouses (Warehouses No. 1, No.2 and No. 3), as well as numerous asphalt or concrete paved areas outside the buildings. A Site plan of the former facility is shown on Figure 2.

The Main Production Building, which was built in 1953, was principally brick and block construction on a slab-on-grade. The office area, which comprised a relatively small portion of the eastern side of the Main Production Building, consisted of vinyl tiled floors, suspended ceilings with fluorescent lights, and wood paneled wall dividers. The ceiling of the Main Production Building was open with skylights and metal support beams.

The ancillary buildings were either sheet metal or masonry block walls with wood and metal roof support structures. They were also of slab-on-grade construction.

Also associated with the Site are the process water treatment system and basin, the storm water retention basin, a rail line spur, landscaped areas, employee parking lots, driveways, and until recently, two baseball diamonds. In 2002, these diamonds and associated land (approximately 2 acres) were sold to the City of Anaheim along with access easements. With the exception of the lawn and landscaped areas, north and east of the Main Production Building, and the gravel-covered former truck/van parking area, the entire Site is paved.

3. FACILITY HISTORY

Information regarding Delphi's activities at the Site is based upon a "Chronological History" from 1953 to the present, provided by Delphi, contained within various documents identified within the reference section of this report, and summarized in the following sections.

3.1 Ownership History

A review of historical aerial photographs and topographs indicates that prior to construction of the battery manufacturing facility the Site was used for agricultural purposes (Appendix C). Construction at the Site was evident in the 1953 aerial photograph included with the Environmental Data Resources, Inc. (EDR) report (Appendix C). Delco Remy (General Motors) originally began manufacturing lead acid automobile batteries at this Site in 1954. The Site originally consisted of 88 acres but currently consists of approximately 26 acres. The Site was formerly occupied by an active, one-story manufacturing building with a total of 285,568 square feet of floor space, three warehouse buildings, and an ancillary building. The northernmost portion of the property includes two baseball fields that were leased to and used by the local Little League baseball organization by the mid-1960s (EPA, 1991, Appendix C - EDR). In 2002, Delphi (successor of Delco Remy) sold such land to the City of Anaheim. The baseball fields are adjacent and east of a railroad spur that bisects the Site in a north to south direction. Delphi has occupied the Site for the manufacture of lead acid storage batteries for the automotive industry.

3.2 Operational History

The Site is located in a commercial/industrial section of the City of Anaheim, Orange County, California. A Site plan is shown on Figure 2. As mentioned previously, the Site was used for agricultural purposes prior to construction of the manufacturing facility by Delco Remy. The original production building was constructed in 1953 by Delco Remy, a Division of General Motors, for the production of automotive batteries. The AOIs identified across the Site are listed in Table 1-1 and depicted on Figure 2. In addition, the potential Site-related chemicals and observations at each of the AOIs are also presented in Table 1-1.

The following materials were used in the production of lead acid batteries at the Site:

- **Lead and lead dioxide used in the production of lead plates:** Lead was received in 2,000 pound ingots (hogs) and was stored in the production area on pallets. The majority of the lead was extruded and cut into plates. The remainder was converted into lead oxide, the major ingredient of the paste placed on the plates.

- **Sulfuric acid, which acts as the battery electrolyte:** Sulfuric acid was stored in tanks, mixed in the acid house, and transported to and from the acid filling and acid draining areas through overhead pipes.

- **Polypropylene used to form the battery cases and covers:** Polypropylene pellets were delivered by train cars to two silos on-site. This material was pneumatically transferred to the case and cover-forming areas in the plant where it was melted and extruded to form cases and covers.

- **Polyethylene envelopes used to separate the oppositely charged plates:** Polyethylene film was received in roll form by truck, stored in the production area, and formed into envelopes for the anion plates within the battery.

Smaller quantities of the following materials were also used in battery production or found in the major raw materials:

- Hot melt (glue used to bond the plastic case to the internal lead strap)
- Paper (wood pulp) (used to make the paper labels placed on the exterior case)
- Antimony (in lead alloy used in the early process prior to mid-1980s)
- Tin (in lead alloy used in the new process, circa mid-1980s)
- Calcium (in lead alloy used in the new process, circa mid-1980s)
- Lignosulfonic acid
- Caustic soda
- Silver
- Colloidal carbon

Materials used in support operations include hydraulic oil; propane; water and wastewater treatment chemicals such as sodium hydroxide, coagulants, and biocides; gasoline; and maintenance-related chemicals. Oils and other chemicals were stored either at points of use or in the hallway near the boiler room. Finished batteries, containing approximately one gallon of acid solution each, were stored in the warehouses prior to shipping.

The manufacturing floor occupied most of the Main Production Building. Included were the tool room, encapsulation operation, case and cover molding and assembly areas, lead plate manufacturing area, battery assembly, and battery wet finishing and charging areas, lead oxide manufacturing, and lead reclamation areas. Secondary containment/diversion generally consisted of the concrete floor (some floors were also covered with acid resistant brick) as well as trenches and drains.

Generally, the floor drains and trench drains were part of the process sewer system. In the wet finishing areas, the acid was collected in a separate trench system and recycled. In the case and cover molding areas, the used hydraulic oil was collected in a trench drain that surrounds each station. The oil was pumped out on a regular basis and discharged to an associated oil recovery system waste oil aboveground storage tank (AST).

The railroad line was used to deliver only non-hazardous material to the plant (plastic for the casings?). Site personnel who were interviewed for preparation of this CCR were unsure whether lead was historically delivered by rail. Sulfuric acid was delivered to the Site by truck. According to Site personnel, no significant spills or releases of any of the chemicals used at the Site occurred. In addition, no significant staining or other visual evidence of releases was reportedly observed by Conestoga-Rovers & Associates (CRA) in the vicinity of the chemical storage areas.

3.3 Manufacturing Process

3.3.1 Overview

Delco Remy used a wet soluble process to manufacture the various battery models, totaling approximately 3 million maintenance free lead acid automotive batteries per year during the more recent years of operation. Operations included the manufacture of lead acid batteries, including the plastic battery casings; testing defective batteries returned under warranty; treating wastewater; and maintaining the manufacturing equipment.

The battery manufacturing process included melting and reforming lead by heat treating and cooling. The plant received the lead from an outside source. The lead was melted and reformed into strips that were rolled into coils. The coils were heated and pressed into plates, which were covered with paste consisting of lead oxide, sulfuric acid, and water. The plates were heated in a humidity oven or steam oven, grouped and (as appropriate) wrapped in plastic, and placed into battery cases, which were also manufactured on-site. The batteries were filled with acid, charged for 8 hours, emptied of initial acid, and refilled with fresh acid. The batteries were then sealed and stored on pallets for delivery to customers.

Related on-site operations included plastic injection molding of battery cases and covers, lead oxide manufacturing, lead plate manufacturing, lead paste coating and curing, lead plate encapsulation, battery assembly with welded posts, heat sealing of batteries, acid mixing, and battery wet finishing and charging. Operations also included lead reclamation until the mid-1980s. Attendant support services included tool repair and manufacture, quality control, engineering, warehousing, maintenance and utility services, wastewater pretreatment, stormwater treatment, and employee services. Site photographs are provided in Appendix B.

3.3.2 Detailed Description of Manufacturing Process

The manufacture of lead acid batteries began with the lead plates. Lead pigs or hogs (a pig equals 35 pounds of lead; a hog equals 1 ton) were melted, formed into a strip, and coiled. Soluble oil (2 percent oil, 98 percent water) was used to lubricate the lead as it was rolled to a specified thickness depending on whether it was to be used for a negative or positive plate. The lead was then trimmed to a specified width (scraps are remelted). After the lead strip cooled and hardened, it was perforated. Soluble oil was used again as the lead was pressed and expanded to form a grid. The lead grid strip was cut into rectangular plates and lead oxide paste was applied.

Lead oxide was formed when air was moved through molten lead with agitation in an oxide reactor. From the oxide reactor, the lead oxide went to a settling chamber and to a storage hopper. The lead oxide was ground to particle size and sent through a cyclone collector and baghouse where lead oxide dust was collected. Concentrated sulfuric acid was diluted to 50 percent concentration and added to the lead oxide to form a lead oxide paste that was 10 percent lead sulfate and 90 percent lead oxide. Baghouses provided down-draft ventilation. Air scrubbers cleaned the air of lead. The lead oxide paste was spread on the lead grid strip. Negative plates were stored to dry and positive plates were exposed to 212 degrees F and steam to properly cure.

During final assembly, the plates and lead battery terminals were placed into the plastic battery cases (made on-site), and sulfuric acid was added to the battery. A plastic separator (bought from an outside manufacturer) was used to allow the sulfuric acid to penetrate the plates while preventing the positive and negative plates from touching each other. Once assembled, the batteries were charged in the formation department.

The plastic injection molding process used a plastic rolling machine to form the battery cases and covers. The use of these hydraulic molding units generated used hydraulic oil as well as hydraulic oil used for the lubrication of presses and other plant equipment.

In addition, as part of its quality control program, the facility performed battery autopsies and tested defective batteries since 1954. Approximately 20 failed warranty batteries were received from customers per month.

During the battery autopsies, batteries were placed on a polyvinyl chloride (PVC)-coated workbench, the tops were cut off, and the acid was drained into a PVC-lined sink which drained to the wastewater treatment system. Acid was flushed from the batteries with water. The plastic battery tops were then banded back in place, and the batteries were stored on wooden pallets prior to shipment off-site.

During the manufacturing process, several components were cooled with water, creating wastewater containing lead, oil, or sulfuric acid. The dilution of sulfuric acid generated heat; heat was removed by a heat exchanger, and water in the heat exchanger was sent to a cooling tower; the lead strip mill was cooled with a heat exchanger; the hot water from the heat exchanger was sent to cooling towers; the plastic cases were cooled with water after the plastic cases formed and the water was sent to cooling towers.

Wastewater from the main manufacturing building was collected in a 25-foot by 30-foot holding basin where caustic soda (sodium hydroxide) was added to neutralize the acid in the wastewater and to cause the lead to become insoluble. The neutralization process was as follows: the water was mixed and pumped into three neutralization basins with a total area of 40 feet by 10 feet. Sodium hydroxide was added, and the water filtered through rubber-lined cast iron units with stainless steel filter coated with diatomaceous earth. The filtered water was monitored for pH and lead before being discharged to the sewer. This process was used up until about 1992, when a Lamella clarifier and a moving bed sand filter were added, replacing the diatomaceous earth filter.

3.4 Regulatory History

According to Delphi representatives, no government agent or third party has asserted a claim of on-site treatment, storage or disposal liability against the Site. Delphi representatives indicated that it has not defended any environmental related claims or litigation asserted by any governmental agency or third party related to this Site, and no potential claims or litigation presently exists.

Treatment system permit requirements may require environmental site assessment and possibly subsurface remediation as part of facility closure activities. Closure of the wastewater treatment unit (WWTU) initially commenced pursuant to the requirements for a permit-by-rule (PBR) unit and a closure plan that was approved by the Certified Unified Program Agency (CUPA). However, in 1991, Delphi's predecessor, General Motors, submitted a Resource Conservation and Recovery Act (RCRA) Part A application for the WWTU. According to DTSC, the WWTU unit is technically an Interim Status Unit that is subject to the formal closure requirements of fully permitted treatment units. Consequently, DTSC suspended closure activities of the WWTU until this issue is resolved.

Presently, all aboveground tanks used in the treatment process have been cleaned and removed. The primary basin and weir chambers still require the removal of wastewater and sludges, decontamination, and structure removal.

Currently, Delphi and the DTSC are in discussions to agree on the language of a consent agreement for Delphi to identify and appropriately address areas of concern identified by this CCR and the subsequent FI. At the conclusion of the establishment of the agreed-to remedial or monitoring activities, DTSC will issue a no further action letter and all PBR and RCRA Part A issues will be deemed closed.

3.5 Waste Generation

The Site generated waste during the manufacture of lead acid batteries, during maintenance of manufacturing equipment, while testing defective batteries returned under warranty, and in the treatment of wastewater.

3.6 Waste Management

The Site managed its waste through four general waste streams: solid wastes containing solid lead were transported to an off-site secondary lead smelter for lead reclamation; wastewater containing dissolved lead and acid was treated in the on-site WWTU; spent diatomaceous earth from the WWTU filters was disposed of at a Class I landfill; and wastewater containing oil was shipped to an oil recycler.

Previous management of waste generated at the Site can be divided into waste collection areas, accumulated material storage areas, and regulated discharges. The following three subsections (3.61, 3.62 and 3.63) were derived from the EPA (1992) *Preliminary Assessment* document.

3.6.1 Waste Collection and Pure Product Areas

50-gallon Steel Buckets: Lead dross and scrap lead were collected in buckets at satellite accumulation points near the strip milling machines. When full, the buckets were removed and stored within an indoor staging area .

55-gallon Containers: Lead slurry and defective battery plates were collected in 55-gallon containers at satellite collection points near the plate pasting machines before being stored within an indoor staging area.

Plastic-lined Cardboard Boxes / 1 Cubic Yard Metal Containers: Reclaimed lead (including off-specification plates) was collected in the above referenced containers and sent to an off-site smelter.

Concrete Channel: Waste lead oxide slurry, generated from the pasting operation, was washed into a concrete channel which led to the "1983 Vacuum Filter Machine."

1983 Vacuum Filter Machine: This vacuum filter machine was used to spread the lead oxide slurry on a sheet of filter paper by applying a vacuum to the underside of the paper to extract water from the slurry. This wastewater was sent to the WWTU to be treated and to precipitate the dissolved lead. The lead oxide residue and filter paper were put in open containers for further air drying and then were sent to the hazardous waste storage area (permitted for 90 days).

Baghouse: Lead dust from plate heating was collected in a baghouse. The baghouse was periodically emptied, and the dust containing lead was stored in 55-gallon containers in the reclaim room.

Outdoor Tank Area: Outside ASTs included three 8,500-gallon pure acid tanks, two 6,000-gallon acid reclaim tanks, one 7,000-gallon karbated acid tanks (where the acid is diluted), two 180,000-pound tanks containing polypropylene, one 6,000-gallon tank of used oil, one 1,500-gallon oxygen storage tank, and one 511-gallon argon tank.

Hydraulic Oil Collection Channels: Epoxy-coated concrete collection channels surrounded the plastic battery case molding units. These "blind" channels contained water and hydraulic oil resulting from any leakage of the hydraulic molding machines.

Battery Autopsy Area: In this area, batteries (many returned by customers) were cut open, the acid was drained, and batteries were tested to determine the reason for failure. The floor in this area was constructed of 12-inch thick concrete and sealed with protective epoxy coating. Secondary containment was provided by the sloped concrete floor which directed the waste fluids to the WWTU. Lead and plastic were reclaimed and acid was collected and recycled.

Indoor Sodium Hydroxide Tank: The 5,600-gallon sodium hydroxide storage tank was located over an epoxy-coated concrete sump with no drains. Periodically, the material in the sump was pumped to the WWTU and reused for adjusting pH.

3.6.2 Accumulated Material Storage Areas

Hazardous Waste Storage Area: The hazardous waste storage area was located inside Warehouse No. 3, which was situated on the western portion of the Site. The area stored empty, unused drums as well as 55-gallon drums that contained virgin materials such as acids and wastes.

Collection/Processing Tanks: Soluble oil wastewater from processing was collected in four 120-gallon tanks which were located on a concrete slab inside the building. Water was drained through a sump at the Oil Pump House to the WWTU. The waste oil was pumped to above ground tanks and taken off-site by an outside vendor.

Wash Down of Equipment: Oil-contaminated wastewater from equipment wash down was collected in a 6,000-gallon tank (refer to Section 3.6.1). The facility typically generated approximately 5,000 gallons of oily wastewater per month.

Outside Wooden Pallets: Defective batteries from the final assembly process were loaded on pallets and stored in an area between the manufacturing building and the warehouse. After the used batteries were tested in the battery autopsy area, they were resealed and stored with other defective batteries awaiting off-site disposal.

Indoor Gondola Bin and Roll-off Bins: Used diatomaceous earth was handled by placement into an indoor gondola bin that was periodically dumped into two 20-cubic-yard, covered roll-off bins. Secondary containment around the filter press and indoor gondola bin was provided by an epoxy-coated, sloped, concrete floor that drained back into the wastewater treatment system. The roll-off bins were located in an area outside believed to be just north of Warehouse No. 3. The roll-off bins were plastic-lined and may also have contained other lead-impacted material, gloves, and lead-contaminated clothing. An estimated average of 30 cubic yards of lead-containing diatomaceous earth was generated per month.

3.6.3 Regulated Discharges

Wastewater Treatment Unit: The WWTU's 60,000-gallon holding basin and three 12,000-gallon neutralization basins were located outside in the northwest corner of the Site and were each constructed of concrete and coated with an acid-resistant epoxy material. The sodium hydroxide and reclaimed acid/water tanks were constructed of fiberglass. The holding and neutralization basins and the reclaimed acid/water tanks were constructed as flow-through process underground tanks and did not have secondary containment. The WWTU treated approximately 26 million gallons of water per year.

Stormwater Retention Basin: The runoff flowed to the 380,000-gallon-capacity stormwater basin, except for runoff from the lawn or the parking lot. This stormwater flowed through a pipe along a natural course, through a filter, and into the Magnolia storm drain.

3.7 Spill History

During the Phase II Environmental Site Assessment (CRA, 2005), Site personnel were not aware of any reportable spills or releases associated with Site operations. No evidence of significant spills/releases was observed by CRA at the time of the Site inspection. The concrete floor of the Main Production Building exhibited signs of cracking; however, the concrete floor was well maintained and was reportedly cleaned regularly. According to available facility personnel, only minor hydraulic oil releases and coolant water releases onto the concrete floor inside the building have occurred at the Site. This was consistent with observations made by CRA at the time of the Phase I Site inspection.

For the areas in which sulfuric acid was handled, the floor consisted of acid resistant bricks over concrete. This included the acid tank farm area, where the acid resistant brick showed signs of wear and standing liquid (acid with lead sludge) was observed (CRA, 2005).

CRA reviewed a 1990 letter from the Regional Water Quality Control Board (RWQCB) that indicated the elevated pH detected in the groundwater in the former monitoring well MW-1 was the result of a sodium hydroxide release at the Site. Also, the results of the databases search, No Further Response Action Planned (NFRAP) report, indicates that there had been remedial actions conducted at the Site; however, specific information was not provided.

In 1992 EPA Region IX personnel performed a Preliminary Assessment of the Site, and during interviews with facility workers it was indicated that a diesel spill occurred in 1986. The spill consisted of 14,000 gallons of diesel fuel No. 2 that traveled from the boiler room to the WWTU. The RWQCB supervised site cleanup.

3.8 Previous Site Investigations

Previous environmental investigations were conducted at the Site between 1988 and 2005 to assess soil and groundwater quality at the Site. These investigations are summarized in the following subsections and copies of the reports are provided on a CD ROM disk included in Appendix C. According to Site personnel and Site records, various environmental investigations and assessments have been conducted at the Site. The following summarizes the historical documents of previous investigations provided and reviewed as part of this investigation:

- **Between 1988 and 1991, various documents prepared by Dames & Moore for the remediation of the northwest area of the Site (Northwest Field)**

  These included the following:

  - August 1991: Work Plan for Remedial Action, Delco Remy Site, Northwest Field Area
  - March 1991: Work Plan for Remedial Action, Delco Remy Site, Northwest Field Area
  - October 1989: Revised Report, Evaluation of Remedial Action Alternatives and Selection of an Appropriate Alternative, Delco Remy Site, Northwest Field Area
  - November 1988: Report, Site Assessment and Remedial Action Plan, Delco Remy Facility, Northwest Field and Storm Drain Ditch

- **August 1989: Report, Further Investigation of Groundwater Conditions prepared by Dames & Moore**

  This report documents further groundwater investigation activities conducted to assess the cause of discoloration of groundwater samples collected from monitoring well MW-1 at the Site. This assessment was conducted pursuant to a request made by the RWQCB, Santa Ana Region, dated May 15, 1989. This report documents that six underground storage tanks used for diesel fuel and used oil were removed from two areas of the Site (Areas No. 1 and No. 2). Area No. 1 was located adjacent to the northwest corner of the Main Production Building, while the second area (No. 2) was located adjacent to the central portion of the west side of the Main Production Building and adjacent to the west side of the railroad spur. No contamination was detected in soil samples analyzed from Area No. 1 (Dames & Moore, 1986). Soils excavated from Area No. 2, where used oil had been stored, were found to be impacted with total petroleum hydrocarbons (TPH). Impacted soils in Area No. 2 were excavated and hauled off-site.

  In July 1986, monitoring well MW-1 was installed near Area No. 2. This well was installed in a shallow groundwater zone encountered at a depth of approximately 30 feet below ground surface (bgs). No detectable TPH were found in the groundwater samples but pH values were reported as 9.0 and 9.6. Additionally, the water samples exhibited a cloudy brown color.

In July 1988, two additional monitoring wells (MW-2 and MW-3) were installed in areas several hundred feet to the northeast and southeast of MW-1. No TPH concentrations were detected and the pH values ranged from 7.36 to 7.42.

To determine why the groundwater had a brownish color, groundwater samples were again collected from each of the three wells and analyzed for various parameters. It was discovered that the discoloration was due to dissolved natural organic substances (humic acids) present in the aquifer materials in the soil near MW-1.

- **January 1989: Report, Soil Hydrocarbon Investigation, South End of Former Drainage Ditch, prepared by Dames & Moore**

  This report presents the results of a soil sampling and analysis program for the southern end of the former unlined storm drainage ditch located in the northwest section of the Site. This ditch was used to collect surface drainage resulting from precipitation. This unlined drainage ditch discharged to the Magnolia storm drain channel under an NPDES permit. In September 1988, during the course of lining the ditch, Delco Remy excavated a few feet of soil containing elevated lead concentrations. During soil sampling conducted prior to lining the ditch, hydrocarbon odors and discoloration were observed. Soil samples were collected and analyzed. No benzene, toluene, ethylbenzene, and xylenes (BTEX) or diesel fuel range TPH were detected. However, total recoverable petroleum hydrocarbons (TRPH) concentrations ranging from 1,300 milligrams per kilogram (mg/kg) to 2,600 mg/kg were detected. It was concluded that the soils were impacted due to a past minor hydrocarbon spill and that deeper soils (greater than 7 feet bgs) were not impacted. It was estimated that the soils impacted consisted of approximately 2 to 7 cubic yards.

- **July 1992: Final Report, Visual Site Inspection/Sampling Visit, prepared by PRG Environmental Management Inc.**

  PRG inspected the facility to evaluate SWMUs described in the August 1990 Preliminary Assessment report for Delco Remy and listed in scope of work outlined by the EPA in October 1991. Based on their review of these documents and the findings, 13 SWMUs were identified at the Site. The entire list of this CCR's AOIs identified across the Site, cross-referenced with the SWMU number, is presented on Figure 2. In addition, the location of each of the AOI and SWMU locations is shown on Figure 2. The AOI number and SWMU numbers for the above-noted 13 SWMUs are listed below:

  - SWMU No. 1 (AOIs 22 and 47) - Wastewater Treatment Unit – lead-containing and corrosive wastewater

  - SWMU No. 2 (AOI 25) - Hazardous Waste Storage Area – operated as less than 90-day storage since 1983

  - SWMU No. 3 (AOIs 22 and 47) - Former Gondola Bin and Roll-off Bins – waste diatomaceous earth

  - SWMU No. 4 (AOI 2) - Waste Lead Oxide Slurry Collection Channel

- SWMU No. 5 (AOI 2) - Former Vacuum Filter Machine
- SWMU No. 6 (AOI 8) - Hydraulic Oil Collection Channel
- SWMU No. 7 (AOI 34) - Former Underground Waste Oil Storage Tank
- SWMU No. 8 (AOI 11) - Battery QA/QC and Autopsy Area (a RCRA-regulated unit)
- SWMU No. 9 (AOI 5) - Soluble Oil Collection and Cleaning Area - formerly equipment wash down tank
- SWMU No. 10 (AOI 41) - Oily Waste Collection and Cleaning Area - formerly equipment wash down tank
- SWMU No. 11 (AOI 43) - Former Defective Battery Storage Area
- SWMU No. 12 (AOI 48) - Northwest Field – former storage of dead batteries
- SWMU No. 13 (AOI 33) - Lead-Contaminated Steel Roll-Off Bin

Only one additional SWMU (SWMU No. 13, roll-off bin for lead-contaminated steel) was identified during the Visual Site Inspection (VSI) following the 1990 Preliminary Assessment. No new RCRA-regulated units were identified among the SWMUs identified during the VSI. SWMU locations are shown on Figure 2.

Additional information regarding the above-listed SWMUs is presented below.

SWMU No. 1 (AOIs 22 and 47): Wastewater Treatment Unit - Delco Remy's WWTU was located at the southeast corner of the Site. The WWTU's primary components were an approximately 60,000-gallon fiberglass-lined concrete wastewater holding basin, three approximately 12,000-gallon fiberglass-lined concrete wastewater neutralization basins, and an aboveground sodium hydroxide tank. The WWTU treated acid- and lead-contaminated wastewater collected from various points of the battery manufacturing process (DHS, 1989 and Delco Remy, 1992).

The WWTU was used to neutralize and precipitate metals from the influent wastewater. Precipitated metals (mostly lead) were collected from the clarifier sludge through the filter press (Appendix B). Filter press solids were collected in plastic-lined cardboard boxes and sent to RSR Quemetco for reclamation. Treated water was discharged to the Orange County sanitary sewer system once the discharge met publicly owned treatment work (POTW) requirements (DHS, 1989 and Delco Remy, 1992).

SWMU No. 2 (AOI 25): Hazardous Waste Storage Area - The hazardous waste storage area was located at the north end of Warehouse No. 3, which was located on the west side of the Site. The hazardous waste storage area was constructed of sealed concrete and was divided by epoxy-lined trenches into one waste storage area and two virgin product storage areas, measuring approximately 10 feet by 15 feet each, with a grated epoxy-lined trench around the perimeter. Waste streams stored in this area were contained in 55-gallon drums and may have included paint-related wastes and oil-contaminated items (Delco Remy, 1992).

SWMU No. 3 (AOIs 22 and 47): Former Gondola Bin and Roll-off Bins - The gondola bin and roll-off bins were taken out of use when the new wastewater treatment system was installed in February 1991. During the years when diatomaceous earth was used to filter wastewater, contaminated diatomaceous earth was placed into an indoor gondola bin, which was periodically placed into two larger plastic-lined, 20-cubic-yard roll-off bins (Delco Remy, 1992).

SWMU No. 4 (AOI 2): Waste Lead Oxide Slurry Collection Channel - Waste lead oxide slurry, generated from the battery plate pasting operations, was directed to a grated concrete channel that surrounded each battery plate pasting machine. The slurry from the concrete channel was pumped through a filter press similar in design to the filter press in the WWTU. Solids generated from the filter press were sent off-site for lead reclamation. Residual liquids remaining after pumping the waste lead oxide slurry through the filter press were directed to the WWTU (Delco Remy, 1992).

The filter press replaced the less efficient vacuum filter machine (SWMU No. 5) that was formerly used to filter solids from the waste lead oxide slurry (Delco Remy, 1992).

SWMU No. 5 (AOI 2): Former Vacuum Filter Machine - The vacuum filter machine was replaced by a filter press in July 1991. As noted in the description of SWMU No. 4, the waste lead oxide slurry collection channel, the vacuum filter machine was formerly used to filter solids from waste lead oxide slurry generated in the facility's battery plate pasting department (Delco Remy, 1992).

SWMU No. 6 (AOI 8): Hydraulic Oil Collection Channel - Epoxy-coated and grated concrete channels surrounded the plastic battery case molding machines known as "Cincinnatis" (after the Cincinnati, Ohio-based company that manufactures the machines). The concrete channels collected any hydraulic oil and water that may have leaked from the plastic molding machines (Delco Remy, 1992).

SWMU No. 7 (AOI 34): Former Underground Waste Oil Storage Tank - A 12,000-gallon underground storage tank (UST) that contained waste flux oil for rubber products was located between the railroad tracks and the aboveground used oil tank, just north of the plastic pellet silos. Originally these tanks were used to store sodium hydroxide but were converted to store waste flux oil in 1979. These tanks were removed in July 1986 under a permit issued by the Orange County Health Care Agency (OCHCA). Confirmation sampling was performed by Dames & Moore. A concrete pad up to 2-feet thick with slurry sidewalls was constructed prior to installation of the USTs and it is currently still in place at this location (D&M, 1985 & Delco Remy, 1992). Testing of samples from borings found hydrocarbon impacts approximately two feet thick beneath the tanks but did not find significant lateral migration. In December 1986 remedial excavation of impacted soils was performed to depth of 21 feet bgs under oversight of OCHCA. Testing of confirmation samples found low levels of toluene and TPH but levels remaining were below the OCHCA action levels. Benzene, xylenes and chlorinated solvents were not detected in confirmation samples. Lead was tested for in one of the more impacted confirmation samples and found to only contain 3.3 mg/kg of lead (Dames & Moore, 1987).

SWMU No. 8 (AOI 11): Battery QA/QC and Autopsy Area - The battery quality assurance and quality control (QA/QC) and autopsy area was located in the southeast corner of the Main Production Building at the Site. During battery tests and autopsies, batteries were placed on a PVC-coated workbench, the tops were cut off, and the acid was drained into a PVC-lined sink, which drained to the WWTU. The batteries were then examined to determine why they failed. After examination, the plastic battery tops were banded back in place and the batteries were stored on wooden pallets on the concrete floor near the battery autopsy area (Appendix C), prior to shipment off-site for reclamation (PRC, 1992).

SWMU No. 9 (AOI 5): Soluble Oil Collection and Processing Tanks - The soluble oil collection and processing tanks were part of a soluble oil collection and processing system that was being installed at the Site to reclaim spent soluble machine oils from on-site manufacturing equipment. Prior to the installation of this system, spent soluble machine oils were transferred to the 6,000-gallon aboveground used oil storage tank (located east of Warehouse No. 3) prior to shipment off-site for reclamation (PRC, 1992).

During the VSI, there were four empty polyethylene plastic tanks present in the proposed collection and processing area. Two of the empty tanks had an approximate capacity of 500 gallons and were located within polyethylene containment structures. The other two empty tanks had an approximate capacity of 100 gallons (Delco Remy, 1992).

SWMU No. 10 (AOI 41): Oily Waste Collection and Cleaning Area (Formerly Equipment Wash Down Tank) - The equipment washdown tank identified as SWMU No. 15 (PRC, 1992) refers to an enclosed equipment washing and used oil transfer area known as the "oil house" and the 6,000-gallon aboveground used oil storage tank. The oil house consisted of an approximately 300-square-foot sealed concrete area with a grated sump around the perimeter. The concrete area and sump were covered by a corrugated aluminum structure. The oil house was divided in half by a grated sump and a corrugated aluminum dividing wall (Delco Remy, 1992).

One side of the oil house consisted of a spray washing area for cleaning oil-contaminated equipment. The opposite side contained an approximately 150-gallon used oil transfer tank that held used oils generated by the facility's manufacturing equipment. Used oil deposited in the transfer tank was pumped to the aboveground 6,000-gallon secondarily contained used oil storage tank located directly behind the east side of the oil house (Delco Remy, 1992).

SWMU No. 11 (AOI 43): Former Defective Battery Storage Area - Defective batteries from the battery autopsy area had been stored outside on pallets in an area between the manufacturing building and Warehouse No. 3 (Ecology and Environmental, Inc. [E&E], 1990) (Appendix C). These batteries were also stored indoors on pallets, adjacent to the battery autopsy area. Defective batteries were shipped to RSR Quemetco for lead reclamation (Delco Remy, 1992).

SWMU No. 12 (AOI 48): Northwest Field - The northwest field at the Site refers to an open field located in the northwest corner of the Site. The northwest field is bordered by the Site property line fence on the north and west sides, a Southern Pacific railroad spur line on the east, and a fence separating the field from the former manufacturing area on the south (Figure 3). The Site's storm water retention basin, which receives runoff from the Site, is located in the southwest corner of the northwest field. Prior to construction of the storm water retention basin, runoff from the Site followed a drainage ditch on the west side of the northwest field, at the present location of the storm water retention basin (E&E, 1990).

Soluble lead concentrations (up to 39.6 milligrams per liter [mg/L] by the California Waste Extraction Test [WET] method) were detected in surface and near surface soil samples obtained from northwest field drainage ditch area prior to excavating the Site for the construction of the stormwater retention basin (Dames and Moore, 1989). The lead impacts in the northwest field have been attributed to dead and defective lead acid batteries that were stored in this area up until the early 1970s. Apparently, sulfuric acid containing lead leaked from the batteries, impacting surrounding soils (E&E, 1990).

During May and August 1989, lead-impacted soil was removed from the northwest field drainage ditch and basin area. Soil was sampled along the ditch under the supervision of the Orange County Health Care Agency's Environmental Health Unit to confirm that the impacted soil had been removed. Excavated soils were chemically treated on-site using an Ensotech system to convert heavy metals into insoluble silicates. After analytical results demonstrated that the soils were no longer impacted, approximately 3,000 cubic yards of treated soil were sent to a Class 3 landfill. According to the Orange County Health Care Agency, soil remediation efforts thus far had addressed the western half of the northwest field (E&E, 1990). According to Delco Remy's consultant, Dames and Moore, a lead-impacted area measuring approximately 300 feet by 18 feet still remained along the eastern side of the northwest field (Dames and Moore, 1989).

During the VSI, a pile of soil was observed on the north end of the northwest field. According to a Delco Remy representative, these soils were identified as clean fill excavated during the stormwater retention basin construction. Lead levels in these soils were reportedly low (less than 5 mg/l by the California WET method). The decision to store these soils on-site was made in conjunction with Orange County Health Care Agency (Delco Remy, 1992).

SWMU No. 13 (AOI 33): Lead-Contaminated Steel Roll-Off Bin - A roll-off bin used for temporary storage of lead–impacted steel prior to off-site disposal was the only SWMU identified during the VSI that was not identified in the Preliminary Assessment. On an occasional basis (up to once per year), an approximately 20-cubic-yard-capacity steel roll-off bin used for temporary storage of lead-impacted steel was placed outside of the northwest corner of the Main Production Building, between the building and the railroad tracks. The steel roll-off bin was lined with plastic sheeting (Visqueen).

According to Ken Rayle, former facility environmental manager, the roll-off bin was used for several years. Although a definite start-up date could not be determined, this occasional practice of using a roll-off bin in this location began in the early 1980s (Delco Remy, 1992). Such a roll-off bin was in place (although empty) during the VSI/SV. The roll-off bin was used for temporary storage of lead-impacted steel parts and equipment. These wastes were generated from repair or replacement of lead acid battery manufacturing equipment. The filled scrap metal roll-off bin was picked up by an outside vendor for use as scrap metal and another bin dropped off in its place. The roll-off bin was empty at the time of the VSI. The roll-off bin was constructed of steel and was lined with plastic sheeting. There have been no documented releases of hazardous wastes or hazardous constituents from the roll-off bin. No liquids or sludges were deposited in the bin.

- **January 1999: Draft Soil Remediation Closure Report, Northwest Field prepared by ENV America Incorporated**

  Between 25 and 31 August 1998, soils were excavated from the northwest field. The reason for the excavation was the presence of elevated lead in the shallow soils. Lead had been detected at concentrations ranging from 38 mg/kg to 9,850 mg/kg. The soil cleanup goal for this activity was 1,000 mg/kg. For each location excavated, confirmation soil samples were collected at depth to confirm removal of the lead-impacted soil above the remedial criteria. A total of 1,108 tons of soil were excavated and shipped to the Laidlaw Environmental Services/Safety-Kleen, Lone Mountain Facility in Waynoka, Oklahoma. Figure 6-6 presents the confirmation and delineation sample results for this investigation.

- **April 2003: Environmental Liability Assessment, prepared by Harding ESE, a Mactec Company**

  Delphi contacted Harding ESE to conduct a liability assessment of the Site to identify significant recognized liabilities at the Site. This assessment identified the following liability:

  - Soil Removal in the Area of the Storm Water Retention Basin – Lack of confirmatory samples for a 1996 soil removal program.

  Five potential areas of liability (PAOL) were also identified. These include:

  - Acid mixing room
  - Unknown piping labeled "Flammable Gas"
  - Used oil and new oil storage areas
  - Hazardous waste storage areas
  - Asbestos in building materials

  These potential areas of concern are discussed further in other sections of this report.

- **Phase I Environmental Site Assessment, Delphi Corporation, Anaheim Battery Operations, 1201 N. Magnolia Ave., Anaheim, California, November 2004, prepared by Conestoga-Rovers & Associates**

  CRA performed a Phase I Environmental Site Assessment of the Site in conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E1527 00 (CRA, 2004). This assessment identified the RECs summarized below. This assessment was performed before the battery operations had ceased.

  Above Ground Storage Tanks (ASTs) (AOIs No. 22 and 24): The acid ASTs were situated on top of acid resistant bricks that sat on top of the concrete slab. While secondary containment for spilled liquids was present, there was a significant amount of liquid pooled around the base of the tanks. Based on the condition of the bricks, the potential for a release from this area was identified.

Raw Material and Chemical Use and Storage (AOIs No. 1-8 and 13): At several locations within the production area, acid was drained and refilled in the individual batteries. This was done in areas where the floor was covered with acid resistant bricks. Based on observations during the Site inspection, the integrity of these bricks was questionable, with an associated risk for release.

Battery Charging Tables (AOIs No. 14 and 23): There were battery charging tables with underflow ventilation shafts in the main production building and south charging building. Around each of these tables, concrete cracks were observed along with sulfuric acid residue buildup.

Oil Processing Area (AOIs No. 30, 33, 41 and 42) : Used oils were transferred from the production area to the used oil processing building via transport carts. They were then dumped into the used oil handling sump from which it was pumped through a particle separator and then to the holding tank. The integrity of the sump could not be determined during the Site inspection.

Solid Wastes (AOI No. 30): According to Site personnel and as observed by CRA, dry sweeper material from the cleaning of the outside pavement areas had been dumped in the northwest area of the Site, adjacent to the former gravel truck parking area. This material has been reportedly removed and properly disposed of off-Site. However, it was concluded that these sweepings contained minor amounts of lead which may have impacted Site soils.

Spills/Releases of Lead Dust (AOIs No. 48, 50, 51 and 52): Releases of lead oxide may have occurred at the Site. The extent to which these releases have impacted Site soil is not known.

- **Phase II Environmental Site Assessment, Delphi Corporation, Anaheim Battery Operations, 1201 N. Magnolia Ave., Anaheim, California, March 2005, Conestoga-Rovers & Associates**

A Phase II ESA field investigation was designed to collect additional data to evaluate five of the eight RECs (CRA, 2005). The Phase II ESA field activities were conducted by CRA on November 16 and 17, 2004, again, before operations had ceased. The objective of the Phase II ESA was to confirm whether compound releases due to Site-related operations have occurred at concentration levels, which may have an adverse impact to the human health or the environment.

The RECs identified during the Phase I ESA (November 2004 by CRA) are as follows:

1. Former underground storage tanks (USTs)
2. Former lead reclamation area
3. Aboveground storage tanks (ASTs)
4. Raw material and chemical storage

5. Battery charging tables
6. Used oil processing area
7. Solid wastes
8. Spills/releases of lead oxide dust

RECs 3, 4, and 5 listed above are not specifically addressed in the Phase II ESA. The results of the Phase II ESA are as follows:

REC No. 1 - Former USTs (AOI No. 34)

No evidence of petroleum hydrocarbon impacts above EPA Region 9 Preliminary Remediation Goals (PRGs) for potential residential or industrial sites was detected at either of the former UST areas.

REC No. 2 - Former lead reclamation area (AOI No. 7)

No evidence of lead impacts above EPA Region 9 PRGs for potential residential (California modified) or industrial sites was detected beneath the concrete flooring of the former lead reclamation area.

REC No. 6 - Used oil processing area (AOIs No. 30, 33, 41 and 42)

No evidence of used oil impacts above EPA Region 9 PRGs for potential residential or industrial sites was detected at the used oil processing area.

REC No. 7 - Solid wastes (AOI No. 30)

Lead concentrations exceeding EPA Region 9 residential site PRGs (California modified) were detected in the 0 to 6 inch bgs surface soil sample from SB 20 collected adjacent to the storm water retention basin. The underlying sample from the 12 to 18 inch bgs interval did not exceed the residential PRG.

REC No. 8 - Spills/releases of lead oxide dust (AOIs No. 48, 50, 51 and 52)

Lead concentration exceeding EPA Region 9 residential site PRGs (California modified) were detected at several Site areas. These areas are as follows:

- Along the railroad spur, particularly along the loading docks (SB 15, SB 16, SB 21, SB 25, and SB 26) in samples collected from 0 to 6, 12 to 18, and 24 to 30 inches bgs;
- The grassy area across from the bagging operations north of the driveway (SB 10 through SB 14) in samples collected from 0 to 6 inches bgs;
- The grassy area near the Guard House (SB 1 and SB 3) in samples collected from 0 to 6 inches bgs; and
- The grassy areas along southern driveway downwind of the breezeway between the air washers (SB 8 and SB 9) in samples collected from 0 to 6 inches bgs.

Elevated concentrations of lead above the EPA Region 9 industrial PRGs were also detected along the railway spur in the 0 to 6 inch interval and the 12 to 18 inch interval, and in the grassy area across from the bagging operations in the 0 to 6 inch interval.

4. ENVIRONMENTAL SETTING

4.1 Location/Land Use

The Delphi former battery manufacturing facility is located at 1201 North Magnolia Avenue in the City of Anaheim, Orange County, California (Figure 1). The Site is situated in a commercial/industrial area in the center of a wider residential area. The Site is a relatively flat rectangular property with frontage along Magnolia Avenue (Figure 2) and is bordered by the following properties:

North: Interstate 5 (I-5) and Southern California Tow Equipment;

East: Magnolia Avenue and farther east by Wickes Furniture, American Cancer College, and Talbert Medical Group;

South: Regional Occupational Program (ROP) Career & Technical Institute and office buildings;

West: CaliWest Car Wash Systems, a vacant office/commercial building, Ryan Herco Pumps, another vacant commercial building, and L&S Screw Machines.

4.2 Regulatory Status of Adjacent Properties

No evidence of adverse impact to the Site from surrounding properties was observed by CRA during the Phase I and Phase II Environmental Site Assessments (ESAs) (CRA, 2004, 2005) and Site personnel were not aware of any adverse environmental impact to the Site from the adjacent properties. One adjacent property, 1236 North Magnolia Avenue, was identified in the EDR database report. This property is listed as having the following occupants:

- FHP Anaheim Commercial Center, and
- Talbert Medical Group

This property was listed in the RCRIS-SQG federal list and in the California UST database as well as the California LUST report. In the LUST report, this property was listed as having a closed status.

Haley & Aldrich obtained an EDR report for the Site in October 2005. The following businesses in the vicinity of the Delphi property were identified in the report and summarized below. A copy of the EDR report is provided in Appendix C.

Century Laminators: 1225 N Knollwood Circle (West of Site)
RCRA LQG - 1 violation exists (unspecified) - compliance achieved in 1994. Wastes generated include oil, polymeric resin waste, oxygenated solvents, other organic solids; one active UST - unknown substance, and two former USTs - unknown substance.

Portable X-ray Labs Inc.: 1151 Knollwood Circle (southwest of Site)
One closed LUST site (gasoline impacted soil only). Wastes generated include photochemicals/photoprocessing waste.

IPC Cal Flex Inc.: 1255 N. Knollwood Circle (just west of Site)
RCRA SQG identified for inorganic solid waste and liquids with metals.

ICEE USA: 1330 Knollwood (northwest of Site)
RCRA SQG. The site was identified as having solutions with less than 10 percent total organic residues.

Micel Inc.: 1240 N Knollwood Circle (west of Site)
RCRA SQG. The site was identified for the following: caustic liquids, chro, selenium, unspecified aqueous solution and liquids with metals and inorganic solid waste.

Aggressive Engineering Corp: 1235 N. Knollwood Circle (southwest of Site)
RCRA SQG: no violations. The site was identified for the following: waste oil and mixed oil, unspecified solvent mixture waste, halogenated solvent waste and the presence of USTs on-site.

Intercem Corp: 1380 Knollwood Circle (northwest of Site)
CERCLIS identified "No Further Remedial Action Planned" and the RCRA SQG indicated "no violations." The SLIC (Spills, Leaks, Investigation and Cleanup) database indicated no other info reported in the database.

L & S Machine Enterprises: 1190 Knollwood Circle (southwest of Site)
RCRA SQG database indicated "no violations." The site was indicated to have unspecified oil containing waste and waste oil/mixed oil.

The LUST database identified the Portable X-ray Labs Inc. at 1151 Knollwood Circle (southwest of Site) as a Case closed for gasoline impacted soil only.

4.3 Local Ecology

There are no surface water bodies or water courses located on or immediately adjacent to the Site. Information obtained from EDR related to the National Wetlands Inventory database indicated that there are no wetlands areas identified within ½-mile of the Site. The closest water body to the Site is an intermittent stream, Fullerton Creek, located approximately 4,000 feet to the north-northwest of the Site. The area immediately surrounding the Site is in a developed urban setting zoned for light industrial/commercial land use.

4.4 Physiography, Topography, and Surface Drainage

The Site is situated within the Downey Plain part of the Coastal Plain of the Los Angeles Basin. The Downey Plain is located south and southeast of the La Brea, Montebello, and Santa Fe Springs Plains, and of the Coyote Hills, and northeast of the Newport -Inglewood Structural Zone (CDWR, 1961). It extends from Ballona Gap across the central lowland of the Coastal Plain of Los Angeles County into the Coastal Plain of Orange County nearly to Santa Ana. The Downey Plain ranges in elevation from 275 feet in the Los Angeles Narrows and 200 feet in the Whittier Narrows to sea level at the ocean near Dominguez Gap. The slope of the Downey Plain varies from 7 to 23 feet per mile, but is generally less than 18 feet per mile. It is essentially a depositional feature, although minor erosion has occurred. Alluvial fans formed by the Los Angeles and Rio Hondo-San Gabriel River systems have coalesced to form a very gentle plain. During past flood times these large rivers have meandered over most of the area depositing their debris. Near the ocean some of the stream deposited sediments are interbedded with marine and tidal sands, gravels, and clays.

The area surrounding and including the Site ranges in elevation from approximately 90 to 95 feet above mean sea level (msl) and appears to gently slope from the east toward the west. Surface drainage in the area surrounding the Site is toward the west-northwest following the general slope of the surface topography. Surface water on the Site is gathered in drains and exits the Site after passing through a stormwater retention basin. As indicated above, the nearest surface water body is Fullerton Creek, located approximately 4,000 feet downslope and northwest of the Site. Fullerton Creek joins Coyote Creek approximately 2 miles downstream from the Site. After approximately 6 miles, Coyote Creek merges with the San Gabriel River which runs for 4 miles before emptying into the Pacific Ocean. Both Fullerton Creek and Coyote Creek are concrete-lined channels with an average flow rate of 4.7 cubic feet per second (cfs). The San Gabriel River is also concrete-lined and has an average flow of 154.73 cfs. These creeks and the river appear to be used only for stormwater/wastewater discharge, including reclaimed sewage effluent. An estimated 69,913 pounds of fish are caught per year in a 3-mile radius from the San Gabriel River's point of confluence with the Pacific Ocean.

Stormwater runoff from the Site (except runoff from the lawn or parking lot) flows to a stormwater retention basin. A pipe takes the stormwater through a filter and into the Magnolia Avenue storm drain. The RWQBC regulates the facility's storm drainage through NPDES No. CA0107093. The Site is located in a 100-year flood zone where shallow flooding occurs with an average depth of 1 foot.

4.5 Climate

The Site vicinity lies within a region that is typically described as having a Mediterranean climate, characterized by warm, dry summers and mild winters. The Western Region Climate Center has collected climatic data at the Yorba Linda, California station (located approximately 16 miles to the northeast) from 1948 to March 2005. The mean temperature in the area ranges from 54.8 degrees Fahrenheit (°F) in winter to 74.0 °F in summer. The record low temperature was 23 °F and the record high temperature was 114 °F. The average annual precipitation is approximately 14.21 inches per year (Western Regional Climate Center, 2004).

4.6 Regional Geology

The Site is situated within the Los Angeles Basin which lies between the Transverse and Peninsular Ranges of southern California and was formed during the late Cenozoic (Yerkes and others, 1965). The basin contains up to 10 kilometers of marine and alluvial sediments in the center of the basin which has undergone a complex multiphase structural history. The structural evolution includes extension and strike slip faulting in the Oligocene and Miocene. During the Pliocene Epoch and Quarternary Period, the basin underwent oblique contraction, through thrusting and strike-slip faulting. The Los Angeles Basin and surrounding areas are an active tectonic region, with documented small to moderate-sized historical earthquakes. Numerous seismically active faults have been mapped throughout the region.

The Site lies within the southern portion of the Central Block of the Los Angeles Basin. The Central Block is wedge shaped in plan view, and extends 55 miles from the Santa Monica

Mountains on the northwest to and including the San Joaquin hills to the southeast. The block is 10 miles wide at the northwest end and broadens to 20 miles wide at the southern terminus and is bounded by active fault zones. Sediments within the block have been folded into parallel, northwest-trending anticlinal and synclinal structures.

4.7 Local Geology

Site reports reviewed during the Phase I ESA report preparation indicate that the Site is underlain by alluvial deposits consisting of poorly consolidated to unconsolidated clay, silt, sand, and gravel of continental origins. Perched groundwater in the area is encountered at a depth of approximately 30 feet bgs with potable aquifers at a depth greater than 100 feet bgs. The groundwater flow direction is reported to be to the southwest.

Information regarding geologic conditions at the Site was collected during the Phase II ESA and the 2005 sampling and analysis activities summarized herein. The overburden at the Site was reported to consist of a surficial layer, comprised of fill materials (gravel and sand), underlain by a native clayey silt soil horizon. The fill layer appears to be discontinuous across the Site and is thickest beneath the loading dock areas where it reaches a maximum thickness of approximately 4 feet. The underlying native material consists of brown, stiff to compact, damp clayey silt. This upper native soil horizon grades downward to light gray brown to light gray silty sand, clayey sand, and clayey silt. The lower material is crudely stratified and is consistent with the alluvial deposits described above.

4.8 Hydrogeology

The Site is located in the upper reaches of the Lower Santa Ana River Basin of Orange County, California. The groundwater basin beneath the Site consists of approximately 3,500 feet of interbedded sedimentary units representing multiple aquitards and aquifers with varying individual thickness and lateral extensiveness. The groundwater basin receives its recharge mainly from surface water brought into the region by the Santa Ana River, which has its origin in the San Bernardino Mountains. Groundwater within the basin is used by many municipal water agencies as a potable water source.

The soils immediately below the Site are classified as belonging to the Bellflower aquitard unit of the Lakewood Formation (CDWR, 1964,1965). Literature indicates that there are three regional groundwater-bearing units underlying the Site: the upper, middle, and lower units. The upper system occurs in stream terrace and older alluvium deposits which extend from 0 to 700 feet bgs. Discontinuous layers may cause hydraulic continuity between the ground surface and the Talbert aquifer. Depth to the Talbert aquifer beneath the Site is approximately 120 feet bgs. The middle system appears to be confined and occurs at approximately 700 to 2,000 feet bgs and consists of multiple layers of sandstone and gravel deposits. The Main aquifer of the middle system occurs at approximately 700 feet bgs. The lower aquifer system is comprised of Pleistocene and older sediments. It occurs at approximately 2,500 to 3,800 feet bgs, in conglomerate, sandstone, and siltstone.

Previous Site investigations indicate silty clay lens and clayey silt with silty clay lens exist from the ground surface to 20 to 25 feet bgs. Sand and a mixture of sand, silt and clay are intermittent below 25 feet. Groundwater was encountered at approximately 28 feet bgs beneath the Site during the 2005 site investigation activities summarized herein. Groundwater flow is reportedly in a westerly direction beneath the Site.

The City of Anaheim's well No. 12 is the nearest potable well to the Site and is located 0.75 mile southeast of the Site (Cal-EPA, 1992). This well is reportedly screened from 450 to 498 feet bgs and is one of 36 wells in the City's system. The City of Anaheim uses 70 percent groundwater and 30 percent Metropolitan Water District (MWD) water (a blend of Colorado River Water, state water, and treated water from Lake Matthew) to provide 53,769 service connections with drinking water. Well No. 16 is located 1.8 miles from the Site and is screened from 384 to 414 feet bgs. Well No. 106 is located 1.8 miles southwest from the Site and is reported to be screened between 182 to 202 feet bgs, 210 to 224 feet bgs, and 540 to 560 feet bgs.

The City of Fullerton obtains 60 percent of its drinking water from a system of 12 municipal wells and 40 percent from the MWD. Water from these sources is not blended. Water from the MWD serves the northern part of the city, while local groundwater serves the southern part. Groundwater serves an estimated population of 66,000 (60 percent of Fullerton's population of 110,000). Although the Fullerton wells are interconnected, they are usually dedicated to one of four service zones. Each of the wells tap the upper aquifer. The nearest Fullerton municipal well, airport well No. 9, is located 1.5 miles northwest of the Site.

The Bastanchury Water Company owns a well located 2.3 miles northeast of the Site which produces approximately 5,000 five-gallon bottles of water per day (one person uses an estimated 1 to 3 bottles per month) (Cal-EPA, 1992).

Groundwater from a City of Buena Park well, located 2.5 miles northwest of the Site, is blended with MWD water to serve 65,000 people (EPA, 1992).

The Site used municipal water for drinking water and an on-site well for watering the lawn. The production well was reportedly at the north end of the site in the grassy area to the north of the Main Production Building near the large water tank.

4.9 Groundwater Monitoring System

Four 2-inch-diameter Schedule 40 PVC monitoring wells were installed at the Site in August 2004. The monitoring wells (MW-1,-2,-3 and -4) were advanced to between 41 and 48 feet bgs with 15 feet of 0.010 slot well screen (Figure 3). The well construction details are presented in Table 2. The monitoring wells were developed after 72 hours and one round of groundwater sampling was performed. A summary of the monitoring well construction details are provided in Section 5 of this report. The wells were sampled and submitted for laboratory testing on 17 August 2005. The results of groundwater monitoring are presented in Section 6. Depth to groundwater was reported between 28 and 30 feet bgs and the direction of flow was in a westerly direction.

5. SAMPLING ACTIVITIES AND PROCEDURES (HALEY & ALDRICH, 2005)

This section describes Haley & Aldrich's methods and procedures for performing soil gas, soil, and groundwater sampling activities at the Site to assess potential AOIs identified during the review of previous Site investigations, site reconnaissance, and the operational history of the facility. Haley & Aldrich performed this field investigation between 11 August 2005 and 18 October 2005. Concrete chip and core data is included through 1 December 2005. Figure 2 is the site plan showing the overall facility layout with building locations, limited interior features, and AOIs. Figure 3 shows the locations of the AOIs, increased facility detail, soil sampling borings, and monitoring wells at the Site.

Samples were collected and handled in general accordance with procedures and guidance documents approved by the DTSC as specified in this section, and in the Quality Assurance Project Plan (QAPP), included as Appendix E. In addition, preparation for and performance of the field sampling program adhered to the guidelines presented in the Health and Safety Plan (HASP), included as Appendix D. The soil gas, soil and groundwater sampling programs are summarized in Tables 1-2 through 1-4. Copies of completed sample chain-of-custody (COC) forms are attached to laboratory reports included on the CD Rom disc included in Appendix H.

5.1 Pre-field Activities

Prior to commencing with the field program, field scoping meetings were held with the DTSC Project Manager to discuss the identification of AOIs and the preliminary sampling strategy. Additionally, meetings were held with the Site demolition contractor (Aman Engineering Construction) to coordinate sampling activities with demolition plans and develop an overall Site communication protocol and ensure compliance with health and safety requirements.

5.2 Development of Delineation Criteria

The determination of whether an AOI was considered "delineated" was based on observations of an apparent release historical surface operational area configuration, decreasing chemical concentration trends from the source area, and/or whether the chemical concentrations at the limits of the investigated area were less than derived delineation criteria. A delineation criterion was derived for each media and detected Site-related chemical by developing chemical thresholds that are considered protective of groundwater quality and protective of human health. The lower of the chemical thresholds was determined to be the delineation criterion for that chemical in the given media. Table 8 presents the concentration thresholds in soil considered protective of human health and groundwater quality, along with the selected soil delineation criteria. Table 9 presents the selected soil gas delineation criteria.

The following documents were used to develop the soil and soil gas delineation criteria:

- DTSC, *date unknown*. Evaluation of Arsenic as a Chemical of Potential Concern at Proposed School Sites in the Los Angeles Area.

- Office of Environmental Health Hazard Assessment (OEHHA), 2005. Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil. November 2004, January 2005 Revision.

- California–Environmental Protection Agency (Cal-EPA), 2005. Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties. January.

- EPA Region 9, 2004. Preliminary Remediation Goals. October.

- California Regional Water Quality Control Board, Los Angeles and Ventura Counties, Region 4 (RWQCB), 1996. Interim Site Assessment & Cleanup Guidebook. May.

- RWQCB, Central Valley Region, 1986. Staff Report – The Designated Level Methodology (DLM) for Waste Classification and Cleanup Level Determination. October 1986, Updated June 1989.

For soils, concentration thresholds deemed to be protective of human health were generally identified as the commercial/industrial California Human Health Screening Levels (CHHSLs) for soil or the California-adjusted EPA soil PRGs for an industrial scenario, with the following exception for arsenic. The health-based concentration threshold for arsenic was based on the natural arsenic background concentration for the Los Angeles area as published in the DTSC document titled *Evaluation of Arsenic as a Chemical of Potential Concern at Proposed School Sites in the Los Angeles Area.*

The EPA PRGs were adjusted using California toxicity values, when those values differed from those on the list of PRGs published by EPA. California toxicity values were obtained in the following order from:

- Cal-EPA, Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and February 2005 California Cancer Potency List, http://www.oehha.ca.gov/risk/chemicalDB/index.asp
- Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, 25 April 2005, http://www.arb.ca.gov/toxics/healthval/ healthval.htm
- Cal-EPA, OEHHA, Chronic Reference Exposure Levels (RELs) for Airborne Toxicants, February 2005, http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html

Concentration thresholds in soil deemed to be protective of groundwater quality were derived using RWQCB and EPA guidance. For volatile organic compounds (VOCs), these thresholds were developed using the 1996 RWQCB Interim Site Assessment & Cleanup Guidebook (RWQCB, 1996), and obtained from the list of EPA soil screening levels (SSLs) using a dilution-attenuation factor (DAF) of 20 published in the EPA PRG tables (EPA, 2004). For non-VOCs (e.g., metals and semivolatile organic compounds [SVOCs]), these thresholds were developed using the 1989 RWQCB staff report titled *The Designated Level Methodology (DLM) for Waste Classification and Cleanup Level Determination*, and obtained from the above-noted list of EPA SSLs.

For soil gas, concentration thresholds deemed to be protective of human health were identified as the commercial/industrial CHHSLs for shallow soil gas. For chemicals where shallow soil gas CHHSLs were not published, they were derived using the same methodology as published in the above-referenced Cal-EPA and OEHHA guidance documents (OEHHA, 2005; Cal-EPA, 2005). The Johnson & Ettinger (J&E) model calculation spreadsheets for these chemicals are provided in Appendix F.

Using generally accepted risk assessment protocols, each organic chemical detected at the Site was conservatively considered a Site-related chemical. A review of the PRC Visual Site Inspection/Sampling Visit (VSI) report (1992)) indicates that Site-related metals associated with historical on-site operations include lead, antimony, arsenic, chromium, mercury, and zinc. (To verify whether other metals detected at the Site should be considered Site-related chemicals, the other detected metals were compared to background levels in California and the western United States obtained from various literature sources. A list of background metals concentrations obtained from the literature and the maximum concentrations of the metals not initially identified as Site-related are presented in Table 10. A review of Table 10 indicates that the maximum concentrations of these metals are generally less than the reported background concentrations, with the exception of cadmium and molybdenum.

A review of the cadmium results indicates that only three soil samples had detected concentrations. The concentrations of these samples (2.25, 9.5, and 9.6 mg/kg), were greater than the literature identified background concentration of 1.7 mg/kg. Since it appears that these detected concentrations are elevated compared to the rest of the cadmium data set, cadmium was added to the list of Site-related metals.

A review of the molybdenum concentrations across the Site indicates that molybdenum concentrations range up to 13.1 mg/kg. A statistical review using probability plots (Appendix F) was conducted to evaluate whether molybdenum may be present on-site at concentrations above site-specific background concentrations. A point-of-departure on a probability plot signifies the possible presence of two distinct data populations (i.e., background and impacted). A review of the probability plots suggests that there may be a point of departure for the molybdenum data at an approximate concentration of 11.1 mg/kg. Samples with concentrations of molybdenum exceeding 11.1 mg/kg include:

- GS0027-SS-001-01 (13.1 mg/kg) at AOI 8
- DP0135-SS-000-01 (11.5 mg/kg) at AOI 26
- DP0115-SS-000-01 (11.4 mg/kg) at AOI 33
- DP0147-SS-005-01 (12.6 mg/kg) at AOI 42

These sample results appear to be only slightly higher than the apparent maximum on-site background concentration of 11.1 mg/kg. Thus, further evaluation was conducted to assess whether these samples also contain elevated Site-related metals concentrations. Based on a review of the sample data, it is concluded that apparently elevated molybdenum results are not collocated with other elevated Site-related chemicals. Therefore, molybdenum was not added to the list of Site-related metals.

5.3 Soil Gas Sampling

Soil gas samples were collected at AOIs previously identified as potential areas where VOCs may have been released. A total of 157 soil gas samples were collected (plus field duplicates and Summa canister confirmation samples) at 76 locations throughout the Site. Prior to initiating full scale sampling across the site a standard purge volume test was performed on the first day of sampling. The purge volume test was performed by collecting one purge volume, three purge volumes and seven purge volumes at the initial sample point.Based on this testing it was determined that seven (7) purge volumes provided the optimum analytical recovery for this site.

5.3.1 Sampling Rationale

Sample depths at these initial boring locations were selected based on the type of historical operations associated with each AOI. In general, sampling was performed at 5 feet bgs and a second sampling depth of 15 feet bgs was included at locations where VOCs were deemed likely to extend to greater depth (for example, near former locations of USTs). A summary of the field sampling program for soil is presented in Table 1-3.

Step-out borings were performed in proximity to initial soil gas boring locations where analytical results indicated that aerial extent of VOC concentrations had not been delineated. This process was performed iteratively until analytical results indicated the lateral extent of on-site soil vapor impacts was less than the delineation criteria or decreasing trends were evident. Likewise, step-down sampling was performed to define the vertical extent of soil vapor impacts at locations where VOC concentrations were greater than the delineation criteria or decreasing trends were not evident. Where step-out sampling was performed, these boring locations were placed in a triangular pattern approximately 10 to 15 feet out from the previous investigation limits. A summary of the soil gas sampling program is provided in Table 1-4 and sampling locations are shown on Figure 3.

5.3.2 Sampling Procedures and Analytical Methods

Soil gas samples were collected by either Interphase, Inc. or H&P Mobile Geochemistry and analyzed by multiple environmental laboratories (American Analytics, Centrum Analytical Laboratory, H &P Mobile Geochemistry, and Jones Environmental) in a manner consistent with the 20 January 2003 Advisory Active Soil Gas Investigation jointly issued by the DTSC and the Los Angeles RWQCB. A summary of pertinent procedures related to the installation and sampling of soil gas probes is presented below:

- Probes consisted of standard, approximately 1-inch-diameter, direct-push (Geoprobe ™ or Strataprobe™) rods equipped with a hardened drip-off stainless steel tip. After the probe was driven to the desired depth using a direct-push installation rig, the probe was retracted to allow the drive point to drop exposing the vapor sampling port. A non-reactive, small-diameter tubing was then inserted through the center of the rod and threaded into a gas tight fitting just above the tip. Thereafter, a hydrated bentonite seal was placed at the base of the probe and the seal allowed to set prior to sampling. After a sample was obtained, the tubing was removed and the probe rod advanced to the next sampling depth or removed.

- The site-specific purge volume test results determined prior to the start of sampling were used as the standard for the investigation. Based on the results of the purge volume test performed during this investigation, seven purge volumes were used during the soil gas sampling program.

- Samples were collected by drawing the soil gas into 125 milliliter (ml) glass bulbs using a SKC Model 224-PCxR4 (or equivalent) personnel sampling pump controlled by a Dwyer RMB-SSV (or equivalent) (range 0-500 milliliters per minute [ml/min]) rotometer set at a flow rate of 200 ml/min. Confirmation soil gas samples were collected in Summa canisters at 10 percent of the sampling locations. The syringe-collected soil gas samples were analyzed by a California-certified mobile laboratory by EPA Method 8260B. The Summa canisters were sent to a California-certified stationary laboratory following standard COC procedures and were analyzed by EPA Method TO-14. Tables 1-2 through 1-4 summarize the analytical methods selected for samples collected at each AOI.

5.4 Soil Sampling

Soil samples were collected at AOIs previously identified as potential areas where Site-related chemicals may have been released. A total of 753 soil samples and step-out samples (including 264 field duplicates) were collected at 442 locations throughout the Site, not including X-ray fluorescence (XRF) sampling for lead in perimeter areas. Thus, of the 753 samples, 388 soil samples were collected for XRF testing at 178 locations in the perimeter areas.

5.4.1 Sampling Rationale

In general samples were collected from the ground surface to 4 inches, 8 to 12-inches, and 14 to 18 inches at most locations. Where historical information supported obtaining deeper samples or alternative sampling strategies, deeper or different sampling horizons were selected. Soil sampling locations (including XRF sampling) are shown on Figure 3. Soil samples collected within each AOI were analyzed as indicated in Table 1-3. The selection of analytical methods, within individual AOIs, was based on the historical operational history and the results of previous Site investigations.

Sample depths at the initial boring locations were selected based on the type of historical operations associated with each AOI. In general, sampling was performed just below the surface (0 to 4 inches), 8 to 12 inches, 14 to 18 inches, and at 5 feet bgs. Where deeper borings were advanced, additional samples were collected (for example, 10, 15 and 20 feet bgs). Specific sampling intervals for each boring location are identified in Table 1-3. Step-out borings were performed in proximity to initial soil boring locations where analytical results indicated chemical concentrations were greater than the delineation criteria or decreasing trends were not evident. This process was performed iteratively until analytical results indicated the lateral extent of soil impacts was considered delineated (i.e., concentrations are less than the delineation criteria, decreasing trends are evident, or where surface staining or other evidence of a release appears to define the extent of impacts). Likewise, step-down sampling was performed to define the vertical extent of chemical impacts at locations where chemical concentrations were greater than the delineation criteria or decreasing trends were not evident. Where step-out sampling was performed, locations were placed in a triangular pattern approximately 10 to 15 feet out from the previous investigation limits. The DTSC lead screening level of 255 mg/kg was used as the delineation criterion. The soil gas sampling locations are shown on Figure 3.

5.4.2 Sampling Procedures and Analytical Methodology

Direct-Push / Stationary Laboratory Testing - Soil sampling was conducted using a truck-mounted direct-push rig (Geoprobe™/ Strataprobe™). The direct-push rig advanced Macrocore barrels (2-inch-diameter) containing acetate lined sample sleeves (1.75-inch) to desired depths using a hydraulic ram or pneumatic hammer system. The direct-push sampling rod was decontaminated between sampling events as outlined in Section 5.7.

The soil types were observed by a field geologist and logged in general accordance with the Unified Soil Classification System (USCS). Soil samples were preserved by placing Teflon™ sheeting and polyethylene caps leaving no headspace, and placing them in sealable plastic bags. Each sample was labeled with the sample number, sample depth, and the date and time sampled. Samples were immediately placed in an ice-filled cooler and transferred to a California-certified stationary laboratory following standard COC procedures.

Selected laboratory submitted soil samples were analyzed by specific EPA Methods based on the historical processes and chemicals used in the AOI. Tables 1-2 through 1-4 summarize the analytical methods selected for samples collected at each AOI.

X-Ray Fluorescence Lead Testing - Soil samples were collected for lead analysis in the field using XRF technology. PCR Mobile Laboratory (PCR) conducted the XRF testing using a Niton 309 XRF Analyzer. In addition, 10 percent of the soil samples subjected to XRF testing were collected and analyzed as confirmation sample at a stationary California-certified analytical laboratory, American Environmental Testing Laboratories, Inc. (AETL) following EPA Method 6010B. Soil sample locations were selected in perimeter area AOIs (unpaved areas exterior to buildings). The soil samples were collected in general accordance with the guidelines provided by the DTSC in *Interim Guidance for Evaluating Lead-Based Paint and Asbestos-Containing Materials at Proposed School Sites* (DTSC, 2001).

Similar to as noted above, each soil sample obtained for XRF testing was collected using direct-push technology. Samples were collected in acetate sleeves. The direct-push sampling rod was decontaminated between sampling events as outlined in Section 5.7. Confirmation samples were obtained from the same section of sleeve extracted for XRF testing and placed in a laboratory-provided glass sample jar. The glass jar was then labeled and placed into a plastic zip-lock bag and stored in a cooler containing ice prior to being picked up and delivered to a California-certified stationary laboratory by courier the next day. Samples were transported to the laboratory or on-site XRF instrument field technician following standard COC procedures.

5.5 Concrete Sampling

Concrete samples were collected at previously identified AOIs or areas where visible staining was observed. These included concrete chip samples and concrete cores collected from targeted areas.

5.5.1 Sampling Rationale

Initial chip samples were collected from the surface at locations of pink-stained concrete. In areas where analytical results showed chemical concentrations above the Site's delineation criteria, additional chip samples were collected as step-outs to delineate these areas. Step-out locations were approximately 10 feet out from previously sampled locations.

Concrete cores were collected in AOIs as well as areas of stained concrete for additional information on the quantities of impacted concrete on the Site.

In general, the sampling and subsequent analytical testing was performed to assess Site conditions as well as assist in profiling stained areas for potential disposal.

5.5.2 Sampling Procedures and Analytical Methodology

Chip sampling was conducted by placing pieces of broken concrete at the surface into individual sealable plastic bags. Any large pieces (greater than 1¼-inch diameter) were broken up and placed back into the bag.

Core samples were collected using an electric powered 1 or 1¼-inch concrete core drill. The cores ranged in length from 6 inches to 12 inches depending on the thickness of the concrete slab at that particular location. The chips and cores were labeled with a sample number, depth, and the date and time of sample collection. Samples were immediately placed into an ice-filled cooler for delivery to a certified California laboratory following standard COC procedures.

5.6 Groundwater Sampling

Groundwater samples were collected to assess overall groundwater quality across the Site and at specific AOIs identified during field activities as areas where chemicals releases may have impacted groundwater. A total of four monitoring wells were installed at the Site. One groundwater sampling event was performed during the Site investigation activities. Samples were analyzed for VOCs, CAM-17 metals, and pH.

5.6.1 Sampling Rationale

During August 2005 four shallow (less than 50 feet bgs) groundwater monitoring wells were installed around the perimeter of the Site to evaluate groundwater quality. The wells were installed following standard requirements defined in Bulletin 74-81 (1981) and 74-90 (1990) of the California Department of Water Resources. The borings were advanced to between 41 and 47 feet bgs with well screens placed in the lower 15 feet of each boring. Wells were constructed of Schedule 40 PVC with a well screen slot size of 0.010 inches. The filter pack consisted of No. 2/12 Monterey Sand. Two to 7 feet of bentonite chips (bentonite seal) was placed above the filter pack. Bentonite–Portland cement grout was placed from the top of the seal to just below the ground surface. A flush mounted, traffic rated, concrete–steel vault was placed around the well at the surface. The wells were developed after 72 hours and samples were subsequently collected and sent to a California-certified laboratory for analyses. Copies of boring logs, well development records, and sampling purge logs are provided in Appendix G. Monitoring well locations are shown on Figure 3.

On 18 October 2005, four step-out groundwater samples were collected for screening purposes using direct-push HydroPunch™ sampling methodology. The temporary wells were placed at and downgradient from AOI 26 (Maintenance Area) and AOI 25 (Hazardous Materials Area) in the northeast corner of Warehouse No. 3. The samples were collected to assess whether groundwater quality had been impacted by chemicals detected in soil in that area.

5.6.2 Sampling Procedures and Analytical Methodology

Monitoring Wells - Prior to sampling each monitoring well, depth to groundwater was measured in each well to the nearest one-hundredth of a foot using an electronic water level sounder. Data from the well gauging was being recorded on a Well Gauging Data Sheet. Data included depth to bottom of well and depth to groundwater from top of casing. Monitoring well vapor concentrations were measured with a photo-ionization detector (PID) following the removal of the well cap, and results were recorded on the Well Gauging Data Sheet. The four groundwater monitoring wells were gauged within a single 24-hour period with the same water sounding tape following decontamination between gauging locations.

The four wells were purged with dedicated Grundfos Redi-Flo2® pumps until the measured specific conductivity, pH, dissolved oxygen (DO), oxidation reduction potential (ORP), and temperature had stabilized and the turbidity met the following requirements:

- The monitoring wells were purged at a pumping rate of 200 to 400 ml/min (i.e., 0.05 to 0.11 gallons per minute [gpm]), ensuring that less than 1.0 foot of drawdown was experienced during the purging operation.

- While purging the wells, measurements of water quality indicator parameters were collected approximately every 5 minutes utilizing a flow-through cell and the results were recorded on a field log. Purging continued until the parameters were stabilized for three successive measurements to the values listed below, or three well volumes were removed (defined as the volume of water in the casing from the bottom of the well casing to the top of the water column):

  - Turbidity ±10%, with final reading less than 10 nephelometric turbidity units (NTUs)
  - Specific Conductance ±3%
  - pH ±0.1
  - Dissolved Oxygen (DO) ±10%
  - Oxidation Reduction Potential (ORP) ± 10%
  - Temperature ±1 degree Celsius

- At completion of purging, the pump discharge tube was disconnected from the flow-through cell. Five groundwater samples (including one duplicate) were collected by lowering a disposable bailer through the well casing. The water from the bailer was then decanted into the appropriate containers, labeled, and placed in a chilled container for transport to a California-certified laboratory following standard COC procedures.

Groundwater samples were analyzed by the following EPA Methods:

- VOCs by EPA Method 8260B
- CAM-17 Metals by EPA Method 6010B/7470A
- pH by EPA Method 150.1

Step-out HydroPunch™ Sampling - The direct-push groundwater sampler was installed in a manner similar to collecting soil samples. The tool was pushed to the desired depth with a disposable tip and the rods were pulled back approximately 1 to 1.5 feet to expose the slotted stainless steel (or PVC) screen, which allowed groundwater to enter into the sampling chamber. The water sample was collected and brought to the surface by means of a standard stainless steel or PVC disposable bailer.

Groundwater samples collected by the HydroPunch were analyzed by the following EPA Methods:

- VOCs by EPA Method 8260B
- SVOCs by EPA Method 8270C (one sample only)
- CAM-17 Metals by EPA Method 6010B/7470A
- PCBs by EPA Method 8082

5.7 Decontamination Procedure for Sampling Equipment

Equipment that came into contact with potentially impacted soil or water was decontaminated consistently so as to minimize the potential for cross contamination and ensure that the collected samples were representative. Disposable equipment intended for one time use was not decontaminated, but was packaged for appropriate disposal. Decontamination occurred prior to and after each use of a piece of equipment. Sampling devices were decontaminated using the following procedures:

- Non-phosphate detergent and tap water wash, using a brush if necessary
- Tap-water rinse
- Deionized/distilled water rinse

5.8 Investigation-Derived Waste Management

During the field sampling program, different types of potentially contaminated investigation-derived wastes (IDW) were generated that include the following:

- Used personal protective equipment (PPE)
- Disposable sampling equipment

- Soil cuttings
- Decontamination fluids

The EPA's National Contingency Plan requires that management of IDW comply with all applicable or relevant and appropriate requirements to the extent practicable. The sampling plan follows the Office of Emergency and Remedial Response Directive 9345.3-02 dated May 1991, which provides the guidance for the management of IDW.

Listed below are the procedures that were followed for handling the IDW:

- Used PPE and disposable equipment were double bagged and placed in a municipal refuse dumpster. These wastes are not considered hazardous and will be sent to a municipal landfill.
- Soil cuttings generated were placed into 55-gallon drums, sealed, and stored on-site pending results of analytical tests. The remaining portion of the open borehole was backfilled to the surface with bentonite.
- Purge water generated was placed in 55-gallon drums, sealed, and stored on-site pending the results of analytical tests.
- Decontamination water, considered nonhazardous waste, was placed in 5-gallon buckets, sealed so that they are watertight, and transported off-site by the drilling contractor for proper disposal.

5.9 Quality Control Sampling Procedures

Field quality control samples associated with the sampling program included duplicate soil gas samples, duplicate soil samples, duplicate groundwater samples and equipment blanks in accordance with the DTSC Preliminary Environmental Assessment (PEA) Guidance Manual (DTSC, 1999). Duplicate samples were collected at a frequency of 10 percent of the primary field samples. Equipment blanks were collected each day of soil/groundwater sampling, and were collected (except for dedicated sampling equipment) after equipment was decontaminated with distilled water.

One travel blank was prepared in the laboratory for each day that soil or groundwater samples were collected and analyzed for VOCs. The travel blanks were shipped to the laboratory with each sampling event. The travel blanks were prepared by the laboratory in a clean environment and kept in the cooler used to ship samples. The travel blank provides a check for cross-contamination during transport and will be analyzed for VOCs.